Ann. Natal Mus. Vol. 37 Pages 131–139 Pietermaritzburg October, 1996

Rediscovery of the endemic South African genus *Mediosetiger* Barraclough (Diptera: Tachinidae: Ormiini)

by

D. A. Barraclough
(Natal Museum, P. Bag 9070, Pietermaritzburg, South Africa)

ABSTRACT

The systematics and biology of the Old World Ormiini (Tachinidae) are briefly discussed. *Mediosetiger* Barraclough, 1983, an endemic and monotypic South African genus, is diagnosed relative to other Old World genera. A key to the southern African genera of Ormiini is provided. *Mediosetiger microcephala* Barraclough, 1983, is redescribed, and a first description of the male and its postabdominal structures is provided; the female postabdomen is also described. Adults of *M. microcephala* were collected from the ceiling of a small sandstone cave in montane grassland at Royal Natal National Park, in the KwaZulu-Natal Drakensberg mountain range.

INTRODUCTION

The afrotropical ormiine fauna comprises some nine species in three genera, namely *Mediosetiger* Barraclough (monotypic), *Aulacephala* Macquart (one species) and *Therobia* Brauer (seven species) (Crosskey 1980). The Madagascan fauna includes only two species of *Therobia* (Crosskey 1980). Ormiini are relatively poorly represented in museum collections in Africa and elsewhere, this probably because of their nocturnal habits. Little synoptic work on the African fauna has been attempted, and only two species have been described since the 1930s (see Séguy 1969, Barraclough 1983). My earlier description of *Mediosetiger microcephala* in 1983 is inaccurate, partly because of the poor condition of the holotype, and the following redescription is intended to entirely supplant it. However, reference should still be made to the figures of the female head in the 1983 paper, as these are not replicated here. Note that I previously incorrectly interpreted median marginal setae as discal setae on abdominal T3 and T4. Discal setae in *Mediosetiger* occur only on T5.

The Ormiini are one of the most biologically interesting tribes of Tachininae because of their unique use of sound to locate potential hosts (Cade 1975). Recorded hosts of ormiines, which all use sound as their principal means of communication, include field crickets (Gryllidae), mole crickets (Gryllotalpidae) and bushcrickets (Tettigoniidae) (Allen 1995). All ormiines of which the life history is known, deposit live planidiform larvae on or near their calling host. These larvae then enter their host through its intersegmental membranes (Adamo *et al.* 1995). Hosts die at or soon after larval emergence, with larval development varying between one to two weeks (Wineriter & Walker 1990; Allen 1995). The planidia of ormiines (see Cantrell 1988: p. 210: Fig. 233) are unusually well-sclerotised in the first instar. This is believed to be an adaptation to prevent desiccation during active host-seeking (Nutting 1953, Léonide 1969, Crosskey 1973).

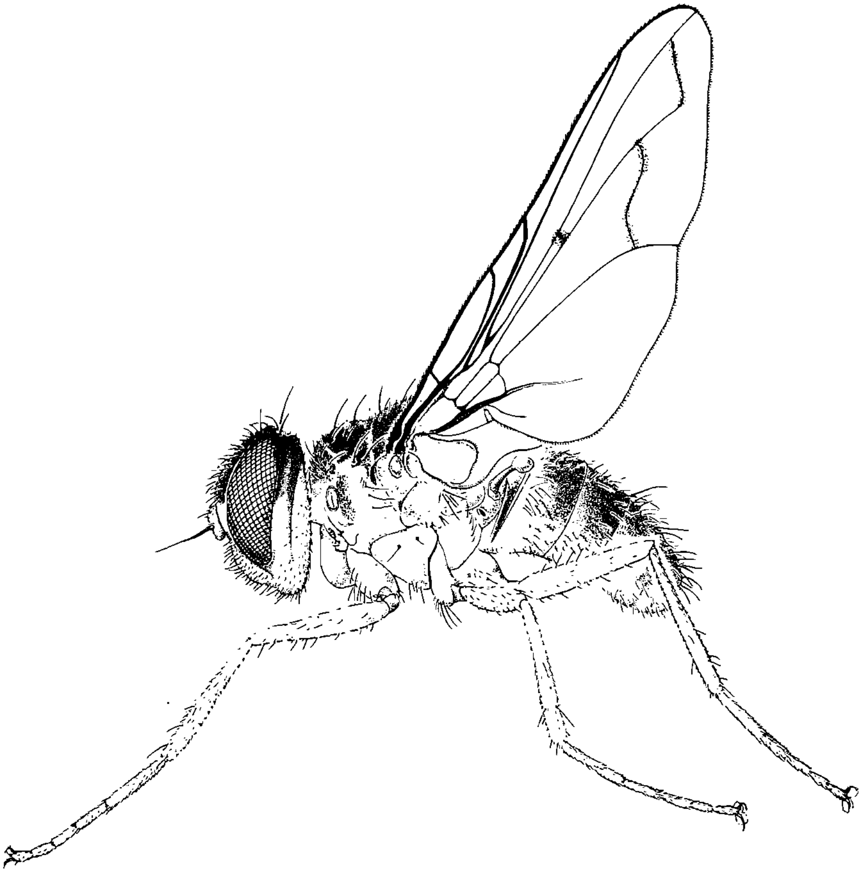


Fig. 1. *Mediosetiger microcephala* Barraclough, 1983, lateral habitus of adult female.

The unique auditory organ of ormiines is a modified and highly inflated, bladder-like prosternum, which is usually easily visible between the fore coxae and head capsule of the adult (Robert *et al.* 1994) (see Fig. 1). The auditory sensitivity of the ormiine 'ear' in at least two species, namely *Ormia ochracea* (Bigot) and *Therobia leonidei* Mesnil, closely matches the frequency spectrum of the host song (Lakes-Harlan & Heller 1992, Robert *et al.* 1992). Great potential exists for the study of African ormiine behaviour and the interaction of regional taxa with their orthopteran hosts. As yet, no host records are known for the afrotropical fauna (Crosskey 1984).

Significant taxonomic tribal treatments of the Ormiini exist in the literature and reference should, for example, be made to Crosskey (1973 1976) and Mesnil (1973). Regional generic identification keys are also available in these works.

MATERIALS AND METHODS

All known material of *Mediosetiger* is deposited in the Natal Museum, (Pietermaritzburg). Terminology is mainly in accordance with Barraclough (1992).

The third antennal segment is abbreviated as A.s.3. Bilaterally symmetrical structures are described in the singular. Holotype label data are quoted exactly as they appear; a slash (/) denotes the end of a line of print and a semicolon separates data quoted on different labels. Body length was measured from the anterior margin of A.s.3 to the abdominal apex. Wing length was measured from the humeral cross-vein to the wing-tip.

All illustrations were drawn using a Wild M5 stereomicroscope, and a drawing tube. The postabdomen of both sexes was removed and cleared in warm KOH, and then examined in glycerine. After examination the postabdomen (and terminalia) were illustrated in glycerine jelly and then stored in glycerine in a microvial beneath each source specimen.

KEY TO SOUTHERN AFRICAN GENERA OF ORMIINI

1 Ocelli absent or vestigial, thus no obvious ocellar boss visible in male, in profile. Pre-alar seta present. Wing with cell R_5 open or just closed at margin, never noticeably petiolate .... **Therobia** Brauer

– Ocelli typically present, ocellar boss obvious in male, in profile. Pre-alar seta absent. Wing with cell R_5 obviously petiolate 2

2 Subfacial region covered by numerous short, recumbent setulae, no noticeable epistomal setae differentiated. Metathoracic spiracle with broad, ovoid, posterior operculum. Wing with some strikingly darker infuscation on membrane of part of basal one-third. Abdominal T3 and T4 without differentiated median marginal setae .... **Aulacephala** Macquart

– Subfacial region with short setulae on outer parts and noticeably differentiated epistomal setae along medial margins. Metathoracic spiracle with elongate, narrow, finger-like posterior operculum. Wing membrane entirely hyaline on basal one-third. Abdominal T3 and T4 with median marginal setae .... **Mediosetiger** Barraclough

TAXONOMY

Mediosetiger Barraclough, 1983

Mediosetiger Barraclough, 1983: 431; Crosskey, 1984: 242.

Mediosetiger was described on a single female (in relatively poor condition) from Giant's Castle Game Reserve in KwaZulu-Natal, South Africa. At the time *Mediosetiger microcephala* was described, the collector of the holotype, Dr B. R. Stuckenberg, informed me that he remembered collecting it from a sandstone cleft. No additional material was discovered until September 1992 when I collected three females and one male from a rock shelter (a small sandstone cave) on a hillside of the Vemvaan River Valley in Royal Natal National Park in the KwaZulu-Natal Drakensberg mountain range. The specimens were taken during late morning on a partly cloudy day. Much of the Vemvaan Valley is montane grassland with isolated patches of shrubs and small trees, and with obvious outcrops of Clarens formation sandstone (Fig. 2). The shelter in question was positioned behind a clump of trees (Fig. 3). Although only about 1.5 m high, it extends at least 3 m into the hillside and

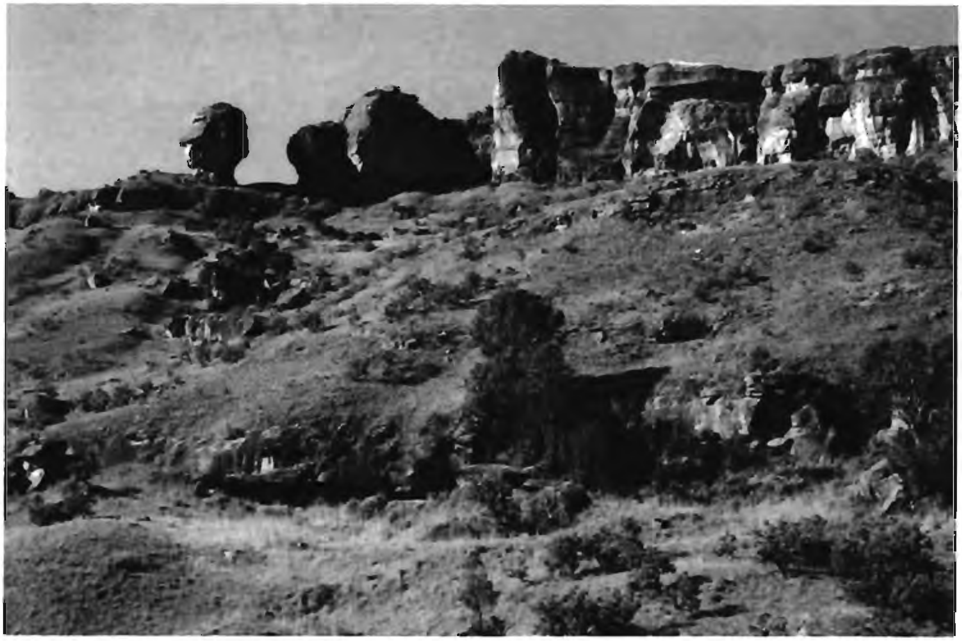


Fig. 2. Photograph of part of Vemvaan River Valley, near Tendele camp, Royal Natal National Park, KwaZulu-Natal, showing montane grassland, isolated patches of trees and small shrubs and Clarens formation sandstone outcrops.

is more than 3 m wide. The floor of the shelter consisted of sand and gravel and probably served as a retreat for porcupines and rock hyraxes. All four specimens of *M. microcephala* were collected from the ceiling of the rock shelter, where they were closely appressed to the sandstone surface. All were very difficult to discern, being well camouflaged. An unidentified muscid species also occurred on the ceiling.

Very little is known about the field ecology or biology of afrotropical Ormiini. I know of no published data about any of the afrotropical species. Further collecting in caves and crevices may show that *Mediosetiger* is distributed along the entire length of the Drakensberg range, including the Mpumalanga (Eastern Transvaal) and Eastern Cape Provinces. Based on the distribution of *Therobia and Aulacephala* in the Afrotropics, both of which are widespread, it seems highly unlikely that these genera retreat to caves or crevices during the daylight hours when they are typically less active.

Mediosetiger has closest affinity with the widepread Old World genus Aulacephala. Both genera lack a pre-alar seta, have noticeable infuscation adjacent to some of the wing veins, and have cell R_5 long-petiolate. Generic distinctions are noted in the above key.

Generic Diagnosis (relative to other Old World genera): Head with eyes separated above in male. Vibrissa absent. Ocelli well developed, ocellar boss prominent in male, in profile. Ocellar setae present. Proclinate orbital setae present in female. Epistomal strip relatively broad, width at buccal margin subequal to or longer than

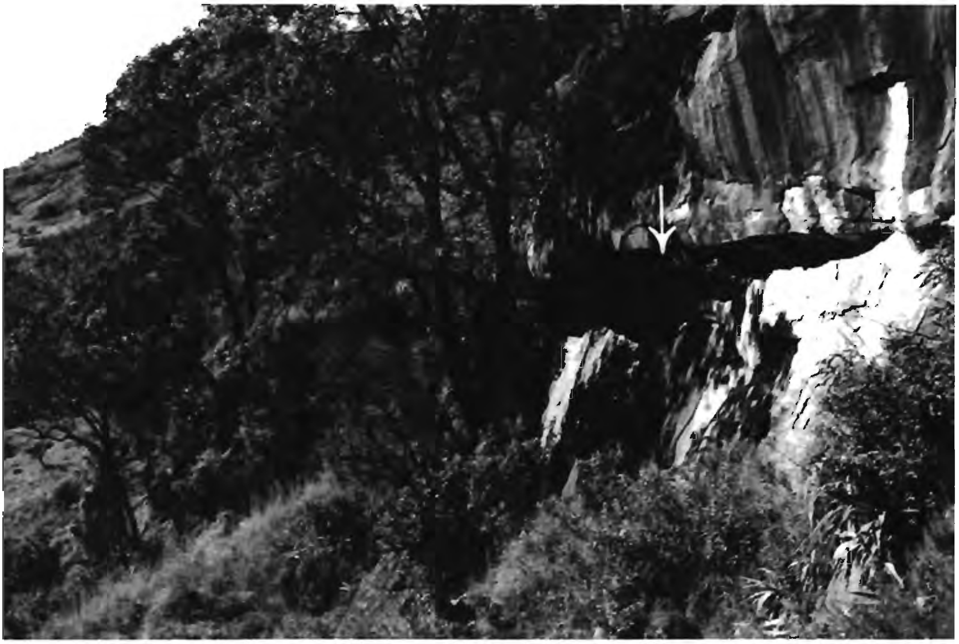


Fig. 3. Photograph of a sandstone rock shelter (arrowed) behind a clump of trees in Vemvaan River Valley, Royal Natal National Park. Both sexes of *Mediosetiger microcephala* Barraclough, 1983, were collected from the ceiling of such a shelter during late morning.

length of A.s.3. Subfacial not prominent, epistomal setae strongly differentiated along its medial margin. Buccal cavity and mouthparts reduced. Prosternum strongly developed. Mesopleuron without any setae differentiated on anterodorsal section. Pteropleural seta not differentiated. Metathoracic spiracle with elongate, finger-like posterior operculum. 1 sa. Prst acr present. Wing membrane with infuscation (albeit sometimes very restricted or inconspicuous) on apical half of wing. Cell R_5 long-petiolate. Abdomen with median marginal setae on T3 and T4 and discal setae over T5.

Mediosetiger microcephala Barraclough, 1983

Figs 1, 4–5, 6–9

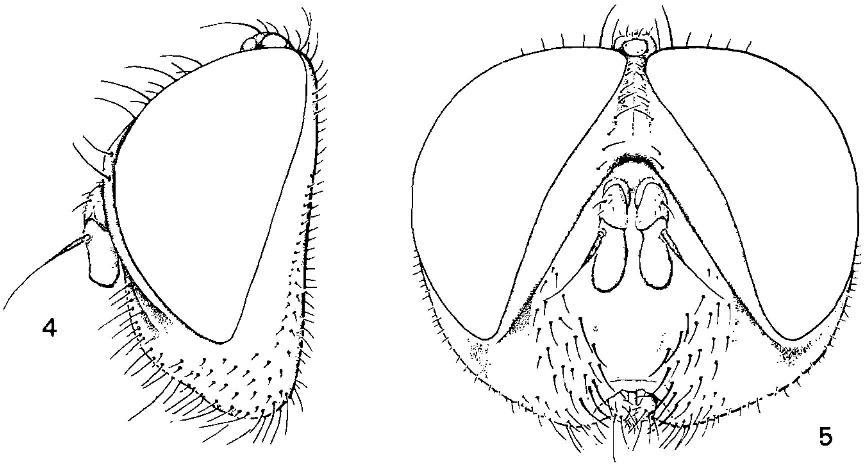
Mediosetiger microcephala Barraclough, 1983: 432.

Holotype: 'South Africa, Natal Prov. / Drakensberg Mts. (2929Ad) / Giants Castle Reserve / Oct.18, 1971 5800 ft. / BR Stuckenberg & ME Irwin'; 'HOLOTYPE ♀ / Mediosetiger / microcephala gen.n. / Det. D.A. Barraclough 1982'. In NMSA; type no. 2580, in relatively poor condition.

Redescription:

Male: Dimensions (in mm): Body length 7.4 mm; wing length 5.7 mm.

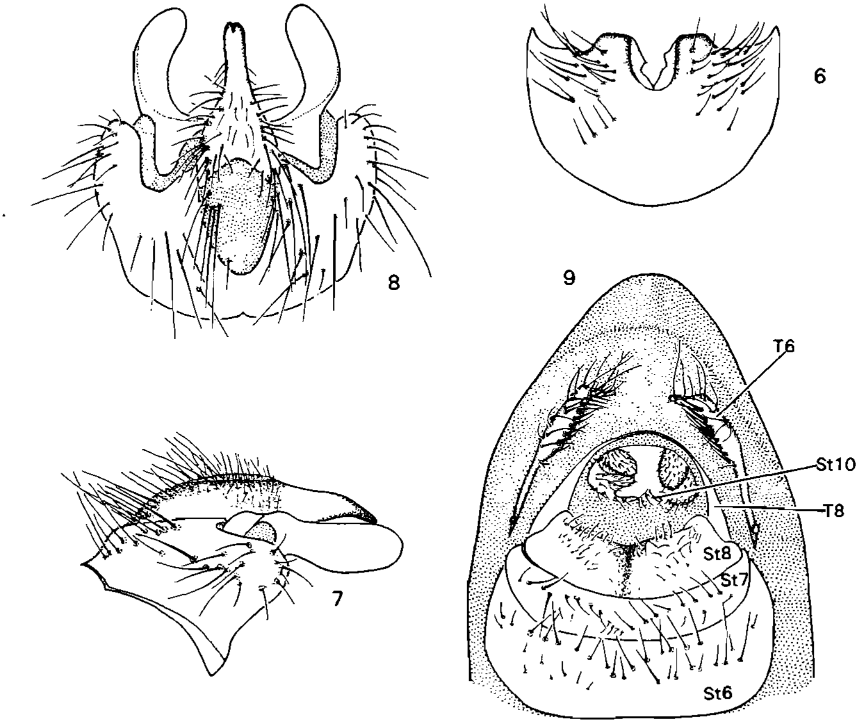
Colour/Pollinosity: Head brown to yellow-brown, albeit somewhat darker on upper



Figs 4–5. *Mediosetiger microcephala* Barraclough, 1983, male head, showing details of all vestiture except eye hairing. 4. Profile. 5. Frontal view.

occiput and on arista; pollinosity densely silver, apparently absent only on interfrontal area. Mesonotum dark brown, except humeral callus yellow-brown; pollinosity relatively dense, silver to noticeably brown; 2 pairs mesonotal vittae (lacking pollinosity), slender medial pair extending from anterior margin of prescutum to two-fifths distance between transverse suture and scutoscutellar suture, broader lateral pair (about twice width medial pair) reaching about half distance between transverse and scutoscutellar sutures. Thoracic pleuron paler, yellow-brown, irregularly darker on parts, pollinosity sparsely silver. Legs, including coxae, entirely pale yellow-brown. Lower calypter mainly brownish infuscated. Wing veins pale yellow, noticeably darker brown on R_1, basal node of R_{4+5}, and on r-m and m-cu; r-m and m-cu surrounded by inconspicuous brownish infuscation on membrane. Abdomen mainly pale yellow-brown, slightly darker along posterior margins of T3 and T4 and noticeably darker over much of T5; pollinosity yellowish and present on T3 to T5, noticeably denser on about anterior one-third of each tergite.

Head (Figs 4 & 5): Profile as in Fig. 4. Ocellar boss well elevated, prominent in profile. Eyes noticeably separated anterior to ocellar triangle (Fig. 5), distance about half width of A.s.3 in profile. Eye hairing present, albeit short and sparse, and visible only with rotation. Frontal setae well developed, longest subequal to or longer than A.s.3. Facial region not heavily recessed, and antennae well evident in profile. A.s.3 evenly rounded apically and surface with short pubescence, strongly narrowed basally. Arista almost twice length of A.s.3. Parafacial markedly wider at upper extent, width here subequal to that of lunula in dorsal view. Subfacial slightly elevated, not flattened, width (that part with setae and setulae) slightly broader than width of upper parafacial. Peristomal setae well developed and extending along entire buccal margin between epistomal region and lower extent of occiput. Proboscis subequal in length to A.s.3. Palpus slender,



Figs 6–9. *Mediosetiger microcephala* Barraclough, 1983, male and female postabdomen. 6. Male St 5, showing shape and vestiture. 7–8. Male terminalia, showing shape and vestiture. 7. Profile. 8. Dorsal view. 9. Female postabdomen, ventral aspect, showing details of all vestiture (heavy stippling = membrane).

slightly broader apically. Genal depth below lower eye margin subequal in length to that of antenna.

Thorax: 1 humeral seta. 1 sa. 1 ph. 1 post ia. 2+3 dc. 1+2 acr. Scutellum with 3 pairs marginal setae and discal setae present on apical third. Wing with second costal sector partly haired ventrally. Basal node of $R_{4+5}$with 3–4 setulae. Crossvein r-m somewhat swollen, positioned slightly basad of insertion of R_1 on costal margin. Bend of M typically angular with short appendix, much closer to wing margin than m-cu. Cell R_5 petiole about 1.5 X length of crossvein r-m. Vein m-cu strongly sinuous. Brownish infuscation inconspicuous, most visible as clouding around r-m, but also apparent around part of m-cu.

Abdomen: T5 slightly longer than T4 in dorsal view. Postabdomen: Sternite 5 as in Fig. 6, not strongly bilobed, but with pair of short, closely approximated knob-like medial prominences. T6 and T7+8 separate and both undivided, T6 with relatively well developed setulae over much of surface, T7+8 with shorter and weaker setulae than T6 concentrated towards posterior margin. Terminalia as in Figs 7 & 8; cerci fused, but with fusion clearly apparent anteriorly in dorsal view, anterior extremity not smoothly rounded, combined width in dorsal view much narrower along anterior two- to three-fifths (noticeably less than half combined width of posterior section); surstylus medially incurved, relatively broad along entire length, broadly rounded apically.

Female: Dimensions (in mm): Body length 5.6–7.6 [5.6]; wing length 5.6–6.6 [5.6].

Colour/Pollinosity: Head mainly yellow-brown, but brown to dark brown on upper two-fifths to half of occiput (sometimes indistinctly so), and on ocellar triangle and arista; pollinosity densely silver to pale yellow, apparently absent only on interfrontal area. Mesonotum, thoracic pleuron, legs and lower calypter as in male. Wing with veins r-m, m-cu and M (between bend and junction with R_{4+5}) irregularly darker and variably surrounded by brownish infuscation on membrane, although this sometimes barely visible. Abdomen paler (yellow-brown) on T1+2, otherwise entirely dark brown; pollinosity silver to yellowish, otherwise as in male.

Head: Eyes widely separated above, distance 1.0–1.2 X dorsal eye width. Eye hairing as in male, not noticeably sparser or shorter. Frontal setae relatively well developed, slightly weaker and shorter than orbital setae; 3 proclinate orbital setae and 1 posterior lateroclinate seta sometimes present; prevertical seta present, positioned just anterior to ocellar triangle and adjacent to margin of interfrontal area; inner vertical seta noticeably longer and stronger than outer vertical. A.s.3 not markedly narrowed at base as in male. Arista 2.0–3.0 X length of A.s.3. Genal depth below lower eye margin slightly to noticeably (1.3 X) more than length of antenna.

Thorax: 1+1/2 acr. Cell R_5 petiole 1.3–2.0 X length of crossvein r-m.

Abdomen: T5 subequal in length to T4 in dorsal view. Postabdomen as in Fig. 9. T6 forming vertically elongate paired structures, not connected above, each sclerite narrowed at dorsal and ventral extremities, ventral two-fifths without any vestiture, dorsal three-fifths with elongate setae on outer parts and inner margin (extreme apical part excepted) with comb of inwardly directed, short, stubby spines; spiracle 7 in membrane adjacent to lateral extremity of St6; T8 slender dorsally, but with much broader lateroventral extremities; cerci apparently fused, but with heavily setulose lateral sections; St10 with ventromedial keel-like row of setulae; St6 and St7 each with marginal and discal setulae; St8 somewhat bilobed and deeply excavated medially, vestiture very short.

Additional material examined: SOUTH AFRICA: *KwaZulu-Natal*: 1♂ 3♀, Royal Natal Nat. Park, Vemvaan River Valley, 28°43'S:28°56'E, 1.ix.1992, Whittington [&] Barraclough, Rock shelter, 1800 m (NMSA).

ACKNOWLEDGEMENTS

The fine illustrations (postabdominal structures excepted) were carefully prepared by Ms K. J. Duxbury, former Scientific Technician in the Entomology Department (Natal Museum). Mr A. E. Whittington, former Assistant Curator of Entomology at the Museum, capably assisted with the collection of material at Royal Natal National Park in 1992. Dr J. G. H. Londt (Director, Natal Museum) kindly photographed the collection locality at Royal Natal. Dr J. E. O'Hara is kindly acknowledged for critically reviewing the paper. The Foundation for Research Development is thanked for continued financial assistance.

REFERENCES

ADAMO, S. A., ROBERT, D., PEREZ, J. & HOY, R. R. 1995. The response of an insect parasitoid, *Ormia ochracea* (Tachinidae), to the uncertainty of larval success during infestation. *Behavioral Ecology and Sociobiology* **36**: 111–118.

ALLEN, G. R. 1995. The biology of the phonotactic parasitoid, *Homotrixa* sp. (Diptera: Tachinidae), and its impact on the survival of male *Sciarasaga quadrata* (Orthoptera: Tettigoniidae) in the field. *Ecological Entomology* **20**: 103–110.

BARRACLOUGH, D. A. 1983. Mediosetiger microcephala, a new genus and species of Ormiini from the Natal Drakensberg (Diptera: Tachinidae). *Annals of the Natal Museum* **25** (2): 431–435.

——— 1992. The systematics of the Australasian Dexiini (Diptera: Tachinidae: Dexiinae) with revisions of endemic genera. *Invertebrate Taxaonomy* **6**: 1127–1371.

CADE, W. H. 1975. Acoustically orienting parasitoids: fly phonotaxis to cricket song. *Science* **190**: 1312–1313.

CANTRELL, B. K. 1988. The comparative morphology of the male and female postabdomen of the Australian Tachinidae (Diptera), with descriptions of some first-instar larvae. *Invertebrate Taxonomy* **2:** 81–221.

CROSSKEY, R. W. 1973. A conspectus of the Tachinidae (Diptera) of Australia, including keys to the supraspecific taxa and taxonomic and host catalogues. *Bulletin of the British* Museum *(Natural History). Entomology Supplement* **21**: 1–221

——— A taxonomic conspectus of the Tachinidae (Diptera) of the Oriental Region. *Bulletin of the British Museum (Natural History). Entomology Supplement* **26**: 1–357.

——— 1980. Family Tachinidae. *In:* Crosskey, R. W., ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History) pp. 822–882.

——— 1984. Annotated keys to the genera of Tachinidae (Diptera) found in tropical and southern Africa. *Annals of the Natal Museum* **26** (1): 189–337.

LAKES-HARLAN, R. & HELLER, K.-G. 1992. Ultrasound-sensitive ears in a parasitoid fly. *Naturwissenschaften* **79**: 224–226.

LÉONIDE, J. C. 1969. Recherches sur la biologie de divers dipterès endoparasites d'orthoptères. *Mémoires du Muséum National D'Histoire Naturelle (N.S.) Ser. A.* **53**: 1–246.

MESNIL, L. P. 1973. Larvaevorinae (Tachininae). In: Lindner, E., ed., *Die Fliegen der Palaearktischen Region.* **64g**: 1169–1232. Stuttgart: Schweizerbart'sche Verlag.

NUTTING, W. J. 1953. The biology of *Euphasiopteryx brevicornis* (Townsend) (Diptera, Tachinidae), parasitic in the cone-headed grasshoppers (Orthoptera, Copiphorinae). *Psyche* **60**: 69–81.

ROBERT, D., AMOROSO, J. & HOY, R. R. 1992. The evolutionary convergence of hearing in a parasitoid fly and its cricket host. *Science* **258**: 1135–1137.

ROBERT, D, READ, M. P. & HOY, R. R. 1994. The tympanal hearing organ of the parasitoid fly *Ormia ochracea* (Diptera, Tachinidae, Ormiini). *Cell and Tissue Research* **275**: 63–78.

SÉGUY, E. 1969. Étude sur les insectes Diptères myiodaires recueillis par M. L. Matile en République centrafricaine. *Cahiers de la Maboké* **6** (1968): 99–110.

WINERITER, S. A. & WALKER, T. J. 1990. Rearing phonotactic parasitoid flies [Diptera: Tachinidae, Ormiini, Ormia spp.]. *Entomophaga* **35**: 621–632.

Date received: 21 November 1995